AMERESCO

Airflow Testing Report

Prepared for

Portland Public Schools

August 2021

9700 SW Capitol Hwy, Suite 110
Portland, OR 97219
ameresco.com

PROJECT OVERVIEW

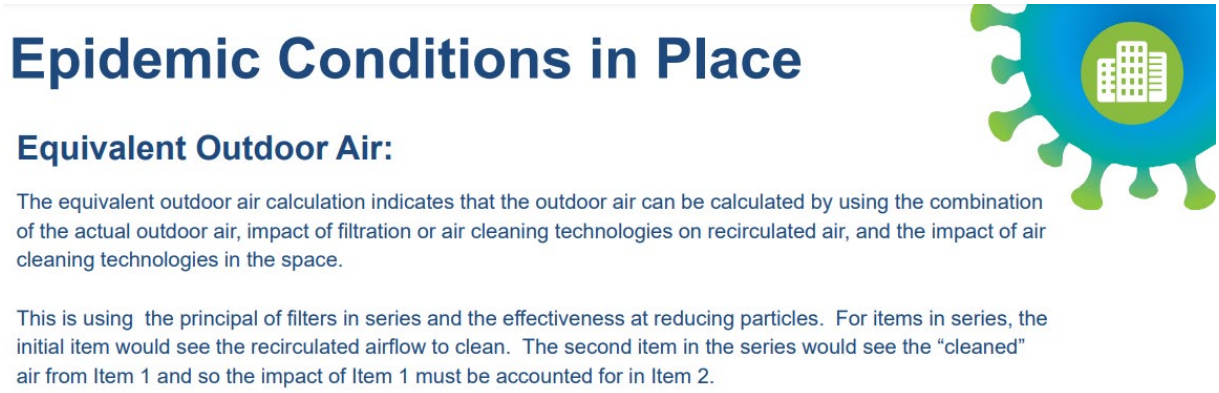
As part of the continuing process to ensure a safe return to in-person learning, Portland Public Schools has contracted with Ameresco to test the airflow and ventilation of all educational and office spaces in each school. The data is reviewed by both Ameresco and PPS personnel to identify any potential shortcomings in the airflow from the HVAC systems. To accomplish this task, Ameresco has partnered with a local NEBB certified Test-Adjust-Balance (TAB) firm, Neudorfer Engineers, who will measure the airflow to each zone with calibrated measurement equipment in accordance with current testing standards and procedures. As part of this effort, HVAC professionals will review the operation of the HVAC equipment serving every educational and office space in each school.

Ameresco is pleased to have partnered with PPS over the last decade as the district's Energy Services Company (ESCO) on six energy efficiency construction projects, four service projects, and numerous energy audits. Our partnership has resulted in reducing over 3,000 tons of CO_2 and other GHG emissions and over $1,000,000 in utility cost savings per year. Ameresco appreciates this opportunity to play a small role in the safe reopening of schools.

About Ameresco, Inc.
Founded in 2000, Ameresco, Inc. (NYSE:AMRC) is a leading cleantech integrator and renewable energy asset developer, owner and operator. Our comprehensive portfolio includes energy efficiency, infrastructure upgrades, asset sustainability and renewable energy solutions delivered to clients throughout North America and the United Kingdom. Ameresco's sustainability services in support of clients' pursuit of Net Zero include upgrades to a facility's energy infrastructure and the development, construction, and operation of distributed energy resources. Ameresco has successfully completed energy saving, environmentally responsible projects with Federal, state and local governments, healthcare and educational institutions, housing authorities, and commercial and industrial customers. With its corporate headquarters in Framingham, MA, Ameresco has more than 1,000 employees providing local expertise in the United States, Canada, and the United Kingdom. For more information, visit www.ameresco.com.

Explanation of ASHRAE Total Effective Air Changes per Hour (ACH_e) Calculation

ASHRAE has been updating their Building Readiness document to reflect the most current understanding in the engineering community for how to operate and maintain buildings during the pandemic. Their update on 4/27/2021 provided an explanation of the impact air filters and air cleaning devices have on the air in buildings. They provided the methodology, formulas, and an Excel-based tool for determining the equivalent outside air a space is receiving by having a mix of outside air, filtered recirculated air, and additional air filtration or cleaning devices in the room. Here is the explanation from ASHRAE:



As part of the airflow testing project that Portland Public Schools has partnered with Ameresco to complete, we are including the calculation of the Total Effective Air Changes per Hour (ACH_e) to show the impact of the air filtration that is active in nearly all spaces in the PPS schools. The formula for doing so is:

$$\mathrm{ACH_e} = \left(ACH_{oa} + ACH_f\right) * E_Z + ACH\_ir$$

where:

- $\mathrm{ACH_{oa}}$ = air changes per hour of outside air = outside airflow in cubic feet per minute * 60 minutes per hour / room volume in cubic feet
- $\mathrm{ACH_f}$ = air changes per hour of clean air from filtered recirculated air with filters of the specified MERV rating as determined by ASHRAE
- E_z = Zone Air Distribution Effectiveness = how effective the HVAC system is at circulating and mixing the air to distribute the clean air throughout the room
- ACH_ir = the air changes per hour of clean air from portable air filters in the room = number of filters * CADR * 60 minutes per hour / room volume in cubic feet
    - CADR = Clear Air Delivery Rate = the CFM of clean air as specified by the manufacturer of the air filter

In order to include these calculations in the airflow testing reports, Ameresco and PPS have made the following assumptions as not all the variables are known:

1. PPS is in process of upgrading the air filters in their HVAC systems to MERV 13 and plans to be complete with that project for the start of the ’21-’22 school year. In this report and for the sake of the ACH_e calculation, we are using the filters that are in place at the time of the measurements, so some of them are still MERV 8.
2. ASHRAE has guidelines for what should be used for the Zone Air Distribution Effectiveness (E_z) based on the HVAC system configuration, but they do not provide a value for every HVAC system and room configuration. For the majority of PPS rooms, an E_z of 0.8 – 1.0 would be most appropriate, so we have made the conservative assumption of using 0.8 for every space as that yields the lower ACH_e.
3. The CADR for a given air filter is from manufacturer ratings and is based on certain conditions (fan speed, particulate size, filter cleanliness, etc.) that change with operating conditions.

NEUDORFER ENGINEERS INC.

TEST REPORT TYPE:
SURVEY REPORT

Portland Public Schools Airflow Testing
Alameda ES
2732 NE Fremont St, Portland, OR 97212

Job Number: 2021-0297

Project Completion Date: **September 2021**
Revision Date: - **Revision Number:** -

SEATTLE

5516 1st Avenue South
Seattle, Washington 98108
Phone (206) 621-1810
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PORTLAND

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Portland Public Schools Airflow Testing
Alameda ES

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REPORT TITLE

CERTIFIED TEST: SURVEY REPORT

Project: Portland Public Schools Airflow Testing
Alameda ES

NEI Job#: 2021-0297

Mechanical Engineer: NA

Architect: NA

HVAC Contractor: NA

TAB Firm: Neudorfer Engineers Inc
Test Engineer: Kevin Ellinghausen

5516 1st Ave South
Seattle, Washington 98108
Phone (206) 621-1810
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CERTIFICATION

Portland Public Schools Airflow Testing

The data presented in this report is a record of system measurements and final adjustments that have been obtained in accordance with the current edition of the NEBB Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems. Any variances from design quantities, which exceed NEBB tolerances, are noted in the Test-Adjust-Balance Report Project Summary.

Significant / Noteworthy Remarks are noted on the General Remarks and General Field Notes pages. Other remarks are noted on individual test sheets.

Noted deficiencies are not the TAB firms responsibility to repair. Prior to issuance of this report, Deficiency Reports are forwarded to our contracted agent.

Warranty is limited to one year from date of this report. Within that time, any discrepancies, ambiguities, or omissions found in this report will be retested, adjusted, or balanced as needed. A written notification will be required.

Submitted and Certified by:

NEBB TAB Firm:	**Neudorfer Engineers Inc**
Certification No:	**3414**
Expiration Date:	**March 31, 2023**
Certification Date:	**March 31, 2021**
(Date completed)	*Signed and Sealed by:*
NEBB Supervisor:	**Mike Vawter P.E.**
NEBB Supervisor:	**Eric Stotts**

TERMS AND ABBREVIATIONS

Project: Portland Public Schools Airflow Testing

AC or ACU	Air Conditioner or Air Conditioning Unit
AH or AHU	Air Handler or Air Handling Unit
AVG	Average
BHP	Brake Horsepower
CAV	Constant Air Volume
CBV	Calbirated Balancing Valve (Circuit Setter)
CC	Cooling Coil
CD	Ceiling Diffuser
CFM	Cubic Feet per Minute
CH	Chiller
CHWS	Chilled Water Supply
CHWR	Chilled Water Return
CP	Circulating Pump
CR	Ceiling Register
CRAC	Computer Room Air Conditioner
CRU	Computer Room Unit
CT	Cooling Tower
CU	Condenser Unit
CUH	Cabinet Unit Heater
CWS	Condenser Water Supply
CWR	Condenser Water Return
DAT	Discharge Air Temperature
DB	Dyr Bulb
DD	Direct Drive
DDC	Direct Digital Controls: EMS Control System for the HVAC
Des.	Design
Dia.	Diameter
Disch.	Discharge
EA	Exhaust Air
EAT	Entering Air Temperature
Economizer	Controls and components that allow an air handler to logically utilize outdoor air for cooling as opposed to the use of mechanical cooling.
EF	Exhaust Fan
EG	Exhaust Grille
EMCS	Energy Management Control System
ERU	Energy Recovery Unit
E.S.P.	External Static Pressure
HRC	Heat Recovery Coil
EWT	Entering Water Temperature
FCU	Fan Coil Unit
FD	Fire Damper
FLA	Full Load Amperage: Maximum amperage a motor can draw.
Flow Hood	Instrument that captures air and converts the reading to CFM.
FHT	Fume Hood Test
FPB	Fan Powered Box
FPM	Feet per Minute
FR	Field Report
FT	Foot, Feet
FTU	Fan Terminal Unit
GPM	Gallons per Minute
HC	Heating Coil
TDH	Pressure Difference across the entering and leaving side of a pump.
HEPA	High Efficiency Particulate Arrestance
HP	Horsepower
HVAC	Heating Ventilation and Air Conditioning
HWS	Heating Water Supply
HWR	Heating Water Return
HX	Heat Exchanger
HZ	Hertz, cycle per second
in.	inches
in.w.g.	inches of water gauge
Kfactor	Correction factor to the free area need to calculate CFM.
KW	Kilowatts
LAT	Leaving Air Temperature
LWG	Low Wall Grille
LWR	Low Wall Register
LWT	Leaving Water Temperature
MAU	Make-up Air Hangling Unit
MBH	1,000 BTUH
N/A	Not Applicable
OSA	Outside Air
OBD	Opposed Blade Damper
∆P	Pressure Drop.
PH	Phase
PSI	Pounds per Square Inch
RA	Return Air
RAD	Radiator
RAT	Return Air Temperature
RF	Return Fan
RH	Relative Humidity
RHC	Reheat Coil
RPM	Revolutions per Minute
RTU	Roof Top Unit
SA	Supply Air
SAT	Supply Air Temerature
S.F.	Service Factor
SF	Supply Fan
SFD	Smoke/Fire Damper
SP	Static Pressure
sq.ft.	square feet
Suct.	Suction
SWG	Sidewall Grille
SWR	Sidewall Register
TAB	Test; Adjust; and Balance
TSP	Total Static Pressure: Difference between the entering and leaving static pressure of a fan.
UH	Unit Heater
VAV	Variable Air Volume; box that contains a motorized damper that modulates airflow.
VD	Volume Damper
VFD	Variable Frequency Drive
Velgrid	Instrument that reads used to read velocity in feet per minute.
VVT	Variable Volume Terminal
WC	Water Column
W.G.	Water Gauge
WB	Wet Bulb

INSTRUMENT CALIBRATIONS

Portland Public Schools Airflow Testing

Instrument Type	Air Data Meter with Flowhood	Instrument Serial #	**M00475**
Instrument Manufacturer	**Shortridge**	Calibration Date	**11/4/2020**
Instrument Model Number	**ADM 870**	Calibration Due	**11/4/2021**

Instrument Type	Differential Pressure Water Meter	Instrument Serial #	**W14090**
Instrument Manufacturer	**Shortridge**	Calibration Date	**10/16/2020**
Instrument Model Number	**HDM-250**	Calibration Due	**10/16/2021**

Instrument Type	Psychrometer	Instrument Serial #	**8084305**
Instrument Manufacturer	**Extech**	Calibration Date	**10/13/2020**
Instrument Model Number	**RH390**	Calibration Due	**10/13/2021**

Instrument Type	Tachometer	Instrument Serial #	**B185B5022P**
Instrument Manufacturer	**Nidec**	Calibration Date	**10/11/2020**
Instrument Model Number	**MT-200**	Calibration Due	**10/11/2021**

Instrument Type	Amp Probe	Instrument Serial #	**33380179WS**
Instrument Manufacturer	**Fluke**	Calibration Date	**10/9/2020**
Instrument Model Number	**323 Clamp Meter**	Calibration Due	**10/9/2021**

Instrument Type	Digital Thermometer	Instrument Serial #	**45400509WS**
Instrument Manufacturer	**Fluke**	Calibration Date	**10/9/2020**
Instrument Model Number	**52 II**	Calibration Due	**10/9/2021**

Instrument Type	Manometer	Instrument Serial #	**M00475**
Instrument Manufacturer	**Shortridge**	Calibration Date	**11/4/2020**
Instrument Model Number	**ADM 870**	Calibration Due	**11/4/2021**

Instrument Type	Thermal Anemometer	Instrument Serial #	**AVM440742003**
Instrument Manufacturer	**Alnor Instruments**	Calibration Date	**11/9/2020**
Instrument Model Number	**AVM 440**	Calibration Due	**11/9/2021**

Instrument Type	Ultrasonic Flow Meter	Instrument Serial #	**N5K1435T**
Instrument Manufacturer	**Fuji**	Calibration Date	**10/14/2020**
Instrument Model Number	**Portaflow-C**	Calibration Due	**10/14/2021**

PROJECT Portland Public Schools Airflow Testing
LOCATION Alameda ES; 2732 NE Fremont St, Portland, OR 97212

REPORT SUMMARY

This project has been surveyed per plans and specifications using the National Environmental Balancing Bureau (NEBB) standards and procedures.

The scope of work for this project was to assess the current airflows for each classroom, office, and special purpose space. Air changes per hour were calculated along with the % of OSA for the spaces and any deficiencies found for each piece of equipment has been noted in the following report.

All ventilation equipment was commanded to run by the BMS system. Ventilation units were measured with a flowhood on the supply outlets. Outside air was recorded with a flowhood on the OSA louvre where accessible. AK factors were calculated from flowhood readings. The remaining OSA values were recorded with a velgrid. AHU supply air was recorded by a summation of the outlets as recorded by flowhood or velgrid when appropriate. Outside air was recorded with a velgrid or airfoil and calculated by the free area method.

The measured airflows in this report represent the performance of the equipment at the time of measurement, which vary over time based on operating conditions. There are factors outside the control of Neudorfer that impact airflow, and variance in those factors is expected and normal. One significant factor is the MERV rating and condition of the air filters on the equipment. During the summer of 2021, PPS began upgrading the filters on all their fan systems to MERV 13. Those upgraded filters are more effective at capturing particles but also impact the amount of airflow from the equipment. These filter changes were occurring while the airflow measurement project was happening, so some schools had the new filters, and some had the old filters at the time of measurement. On the data page included this report, there is a line stating whether or not the upgraded filters were in place at the time of measurement.

Neudorfer Engineers. Inc.
Consulting Engineers Seattle Portland
www.NeudorferEngineers.com

AIRFLOW SURVEY REPORT

Project: Portland Public Schools Airflow Testing
Location: Alameda ES; 2732 NE Fremont St, Portland, OR 97212
Filter Status: Not Upgraded

Room	Equipment Info		Room Dimensions					Airflow Measurements			Calculated ACH					Notes
	Served By	Equipment Type	Room Length	Room Width	Room Area	Room Height	Room Volume	Total CFM Supply	OA CFM Supply	OA %	Air Changes per Hour (supply)	Air Changes per Hour (OA)	# of Portable Filters	Total Effective Air Changes per Hour (ACH_e) with Portable Filter	Total Effective Air Changes per Hour (ACH_e) without Portable Filter	
Lower Level																
Rm B43	UV	UV	29.2	27.7	808	8.8	7,134	570	115	20%	4.8	1.0	1	4.7	2.5	
Rm B44	UV	UV	29.2	27.5	803	8.8	7,090	640	145	23%	5.4	1.2	1	5.0	2.8	
Rm B46	UV	UV	29.0	27.5	798	8.8	7,042	615	300	49%	5.2	2.6	1	5.5	3.2	
Rm 200	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0	N/A	0.0	Area is open air space linked to playground
First Floor																
Rm 100	Fan Unit	Fan Unit	30.5	27.5	839	11.0	9,226	210	210	100%	1.4	1.4	1	2.8	1.1	
Rm 101	Fan Unit	Fan Unit	30.5	27.5	839	11.0	9,226	210	210	100%	1.4	1.4	1	2.8	1.1	
Rm 102	Fan Unit	Fan Unit	30.5	27.5	839	11.0	9,226	210	210	100%	1.4	1.4	1	2.8	1.1	
Rm 103	Fan Unit	Fan Unit	30.4	27.5	837	11.0	9,202	200	200	100%	1.3	1.3	1	2.7	1.0	
Rm 104	UV x2	UV x2	38.9	22.7	882	11.7	10,297	905	360	40%	5.3	2.1	1	4.6	3.1	
Rm 105	UV	UV	32.7	28.5	1,003	11.7	11,709	870	430	49%	4.5	2.2	1	4.1	2.8	
Rm 106	UV	UV	32.0	24.0	768	11.7	8,963	685	285	42%	4.6	1.9	1	4.5	2.7	
Rm 107	UV	UV	37.8	27.0	1,019	11.7	11,895	135	0	0%	0.7	0.0	1	1.6	0.3	
Rm 108	UV	UV	31.7	22.9	726	11.7	8,471	850	290	34%	6.0	2.1	1	5.2	3.4	
Rm 110	UV	UV	31.4	22.9	720	11.7	8,404	540	120	22%	3.9	0.9	1	3.9	2.0	
Rm 111	UV	UV	30.0	27.3	820	11.7	9,568	500	135	27%	3.1	0.8	1	3.3	1.7	
Rm 115	UV	UV	30.0	29.5	885	10.0	8,850	100	0	0%	0.7	0.0	1	2.1	0.3	UV was running in heating mode when measuring
Rm 116	UV x4	UV x4	127.3	22.9	2,905	11.7	33,897	1,810	620	34%	3.2	1.1	1	2.3	1.8	
Rm 134	UV	UV	31.8	22.9	728	11.7	8,492	486	82	17%	3.4	0.6	1	3.6	1.7	
Rm 136	UV	UV	32.1	22.9	735	11.7	8,581	1,080	95	9%	7.6	0.7	1	5.4	3.6	UV was running in heating mode when measuring
Rm 138	UV	UV	32.1	22.9	735	11.7	8,581	1,115	40	4%	7.8	0.3	1	5.4	3.6	UV was running in heating mode when measuring
Rm 139	UV	UV	40.6	30.8	1,153	11.7	13,456	910	225	25%	4.1	1.0	1	3.3	2.2	
Rm 140	UV	UV	31.3	24.0	750	11.7	8,753	755	400	53%	5.2	2.7	1	5.1	3.3	
Rm 140B	UV	UV	38.7	22.9	886	11.7	10,343	630	395	63%	3.7	2.3	1	3.9	2.4	

Date: 4/20/2021 Readings By: Kevin E

AIRFLOW SURVEY REPORT

Project: Portland Public Schools Airflow Testing
Location: Alameda ES; 2732 NE Fremont St, Portland, OR 97212
Filter Status: Not Upgraded

Room	Equipment Info		Room Dimensions					Airflow Measurements			Calculated ACH					Notes
	Served By	Equipment Type	Room Length	Room Width	Room Area	Room Height	Room Volume	Total CFM Supply	OA CFM Supply	OA %	Air Changes per Hour (supply)	Air Changes per Hour (OA)	# of Portable Filters	Total Effective Air Changes per Hour (ACH_e) with Portable Filter	Total Effective Air Changes per Hour (ACH_e) without Portable Filter	
First Floor																
Rm 141	UV	UV	29.3	27.8	816	9.0	7,346	605	335	55%	4.9	2.7	1	5.3	3.2	
Rm 142	UV	UV	29.3	27.8	816	9.0	7,346	50	35	70%	0.4	0.3	1	2.4	0.3	**Note #1**
Rm 143	UV	UV	29.2	27.8	812	9.0	7,306	695	0	0%	5.7	0.0	1	4.7	2.5	**Note #2**
Rm 144	UV	UV	29.2	27.7	807	9.0	7,264	545	270	50%	4.5	2.2	1	4.9	2.8	
Rm 148	UV	UV	29.2	27.7	807	9.0	7,264	670	395	59%	5.5	3.3	1	5.8	3.6	
Rm P1	UV	UV	32.2	22.2	713	11.5	8,202	750	395	53%	5.5	2.9	1	5.4	3.5	
Rm P2	UV	UV	54.3	23.3	1,266	11.5	14,555	1,245	625	50%	5.1	2.6	1	4.3	3.2	
Office 105B	-	-	13.4	10.4	140	11.7	1,631	-	-	-	0.0	0.0	1	9.6	0.0	Ventilation served from adjacent corridor
Office 113	-	-	21.7	8.5	184	8.3	1,534	-	-	-	0.0	0.0	1	10.2	0.0	No forced air in space, only natural ventilation.
Office 123	Exhaust Fan	Exhaust Fan	14.8	10.3	151	11.9	1,802	-65	0	0%	2.2	0.0	1	9.6	1.0	No supply air to space, only exhaust air.
Office 127	Exhaust Fan	Exhaust Fan	10.8	10.3	112	12.0	1,347	-165	0	0%	7.3	0.0	1	14.8	3.3	No supply air to space, only exhaust air.
Conf Rm 122	FCU-01	FCU	19.9	14.8	294	11.8	3,452	224	29	13%	3.9	0.5	1	6.4	1.9	
Office 122A	FCU-01	FCU	14.8	8.3	124	8.9	1,102	179	23	13%	9.7	1.3	1	18.9	4.8	
Office 130A	FCU-01	FCU	12.4	8.3	103	9.0	931	212	28	13%	13.7	1.8	1	23.5	6.7	
Conf Rm 130B	FCU-01	FCU	14.1	12.4	175	11.7	2,041	169	22	13%	5.0	0.6	1	10.1	2.4	
Conf Rm 130C	FCU-01	FCU	12.4	9.8	121	11.7	1,412	280	36	13%	11.9	1.5	1	16.9	5.8	
Conf Rm 130D	FCU-01	FCU	16.6	9.8	162	11.7	1,887	320	42	13%	10.2	1.3	1	13.3	5.0	
Office 206	Exhaust Fan	Exhaust Fan	11.3	10.0	89	7.1	631	-25	0	0%	2.4	0.0	1	25.8	1.1	Room ventilation from exhaust inlet
Auditorium 10	AHU-01	AHU	73.3	49.0	3,593	21.8	78,151	5,080	5,080	100%	3.3	3.3	1	2.9	2.7	
Stage 125A	-	-	49.0	13.7	670	19.2	12,841	-	-	-						Stage air ventilation shared with Auditorium
Gym 137	AHU-01	AHU	66.3	39.2	2,598	22.0	57,159	640	640	100%	0.7	0.7	1	0.8	0.5	
119	-	-	21.0	20.8	437	12.0	5,249	-	-	-	0.0	0.0	1	3.0	0.0	Ventilation served from adjacent corridor
H1	-	-	10.3	7.0	72	8.0	574	-	-	-	0.0	0.0	0	N/A	0.0	No forced air in space, only natural ventilation.
129	-	-	20.9	31.2	587	9.8	5,766	-	-	-	0.0	0.0	0	N/A	0.0	No forced air in space, only natural ventilation.

Date: 4/20/2021 Readings By: Kevin E.

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AIRFLOW SURVEY REPORT

Project: Portland Public Schools Airflow Testing
Location: Alameda ES; 2732 NE Fremont St, Portland, OR 97212
Filter Status: Not Upgraded

Room	Equipment Info		Room Dimensions					Airflow Measurements			Calculated ACH					Notes
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First Floor																
129B	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0	N/A	0.0	Room has been opened up and added to Room 129
130	FCU-01	FCU-01	26.8	12.7	340	9.0	3,059	387	50	13%	7.6	1.0	1	8.8	3.7	
131	AHU-01	AHU	20.8	17.5	365	11.7	4,254	108	23	21%	1.5	0.3	1	4.5	0.8	
132	UV	UV	22.5	22.8	512	11.7	5,974	420	50	12%	4.2	0.5	1	4.7	2.1	
Second Floor																
Rm 200	Fan Unit	Fan Unit	30.5	27.5	839	11.0	9,226	200	200	100%	1.3	1.3	1	2.7	1.0	
Rm 201	Fan Unit	Fan Unit	30.5	27.5	839	11.0	9,226	195	195	100%	1.3	1.3	1	2.7	1.0	
Rm 202	Fan Unit	Fan Unit	30.5	27.5	839	11.0	9,226	175	175	100%	1.1	1.1	1	2.6	0.9	
Rm 203	Fan Unit	Fan Unit	30.5	27.5	839	10.5	8,807	180	180	100%	1.2	1.2	1	2.8	1.0	

Date: 4/20/2021 Readings By: Kevin E.

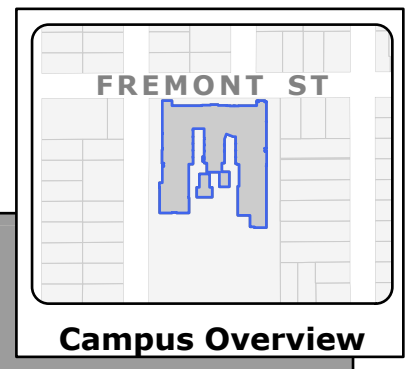
Project: Portland Public Schools Airflow Testing
Location: Alameda ES; 2732 NE Fremont St, Portland, OR 97212

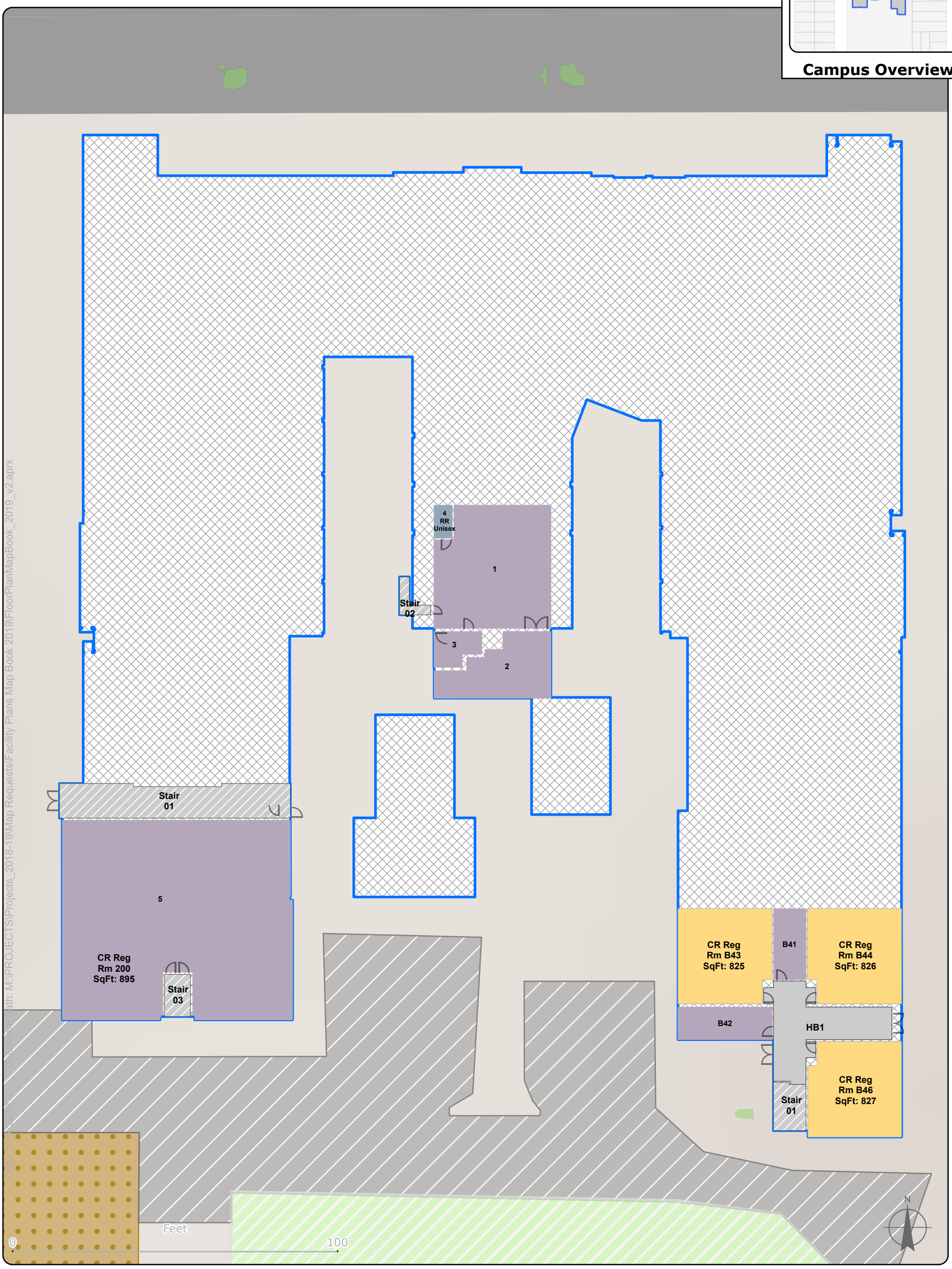
NOTE #	NOTE DESCRIPTION
1	Room 142 - UV was producing large amounts of heat, would not respond to thermostat.
2	Room 143 - 0 OSA was measured at OSA intake with velgrid. Kfactor is 2.69

FOR INTERNAL USE ONLY

DO NOT DISTRIBUTE

ALAMEDA: Lower Level 1





Space Use

- Classroom
- Office
- Rest Room
- Special Purpose
- Corridor
- Other
- Stairs/Elevator

School Grounds

- Campus Footprints
- Athletic Field
- Playground: Paved
- Playground: Unpaved
- Streets
- Doors

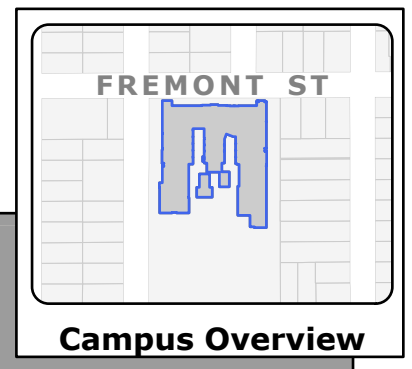
Total Number Of Rooms By Classification

Classrooms: 4	Special Purpose: 0
Office Spaces: 0	Storage: 2

FOR INTERNAL USE ONLY

DO NOT DISTRIBUTE

ALAMEDA: First Floor



CR Art Rm 116 SqFt: 2954
Conf. Room 122
130A
Conf. Room 130C
Conf. Room 130D
Conf. Room 130B
132
CR Reg Rm 134 SqFt: 811
122A
124 RR Unisex
126
130
117 RR Girls
114 RR ADA U
119
121
123
H1
125B
127
129A
131
133 RR Boys
CR Reg Rm 110 SqFt: 796
CR Reg Rm 136 SqFt: 808
129
129B
129C RR Unisex
129D
135
113
CR Reg Rm 115 SqFt: 933
CR Reg Rm 108 SqFt: 808
Auditorium 10
109
CR Reg Rm 111 SqFt: 865
107A
107B
Gym 137
CR Reg Rm 138 SqFt: 789
CR Reg Rm 106 SqFt: 848
CR Reg Rm 107 SqFt: 1030
Stage 125A
CR Reg Rm 140 SqFt: 830
105B
CR Reg Rm 104 SqFt: 974
CR Reg Rm 105 SqFt: 1066
CR Comp Rm 139 SqFt: 1137
CR Reg Rm 140B SqFt: 933
CR Modular Rm P1 SqFt: 875
139A
209
Stair 02
206
CR Perfm Rm P2 SqFt: 1681
CR Reg Rm 102 SqFt: 895
H1
CR Reg Rm 103 SqFt: 895
CR Reg Rm 141 SqFt: 824
CR Reg Rm 142 SqFt: 824
B41
Rm 143?
Rm 144?
CR Reg Rm 100 SqFt: 894
Stair 03
CR Reg Rm 101 SqFt: 894
CR Reg Rm B43 SqFt: 825
CR Reg Rm B44 SqFt: 826
B42
146 RR Boys
Rm 146?
Stair 01
CR Reg Rm B46 SqFt: 827
Feet
0
100
N

Space Use
- Classroom
- Office
- Rest Room
- Special Purpose
- Corridor
- Other
- Stairs/Elevator

School Grounds
- Campus Footprints
- Athletic Field
- Playground: Paved
- Playground: Unpaved
- Streets
- Doors

Total Number Of Rooms By Classification

Classrooms: 26

Special Purpose: 10

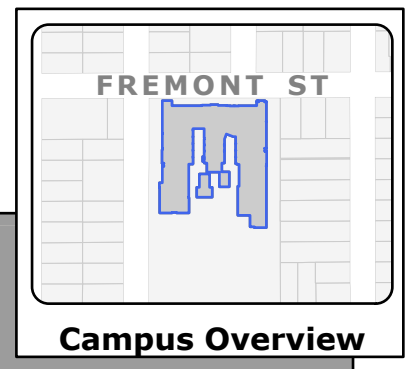
Office Spaces: 11

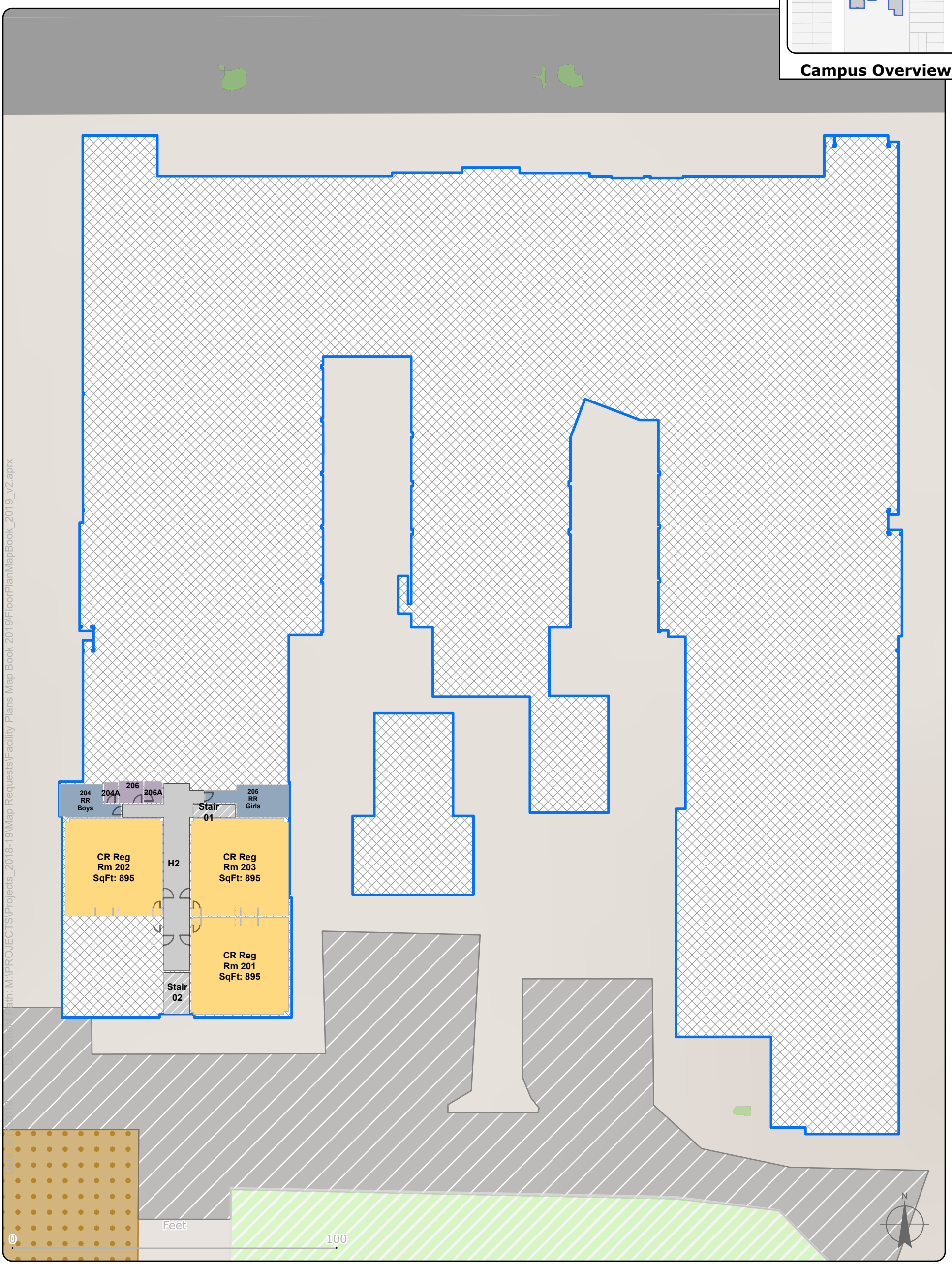
Storage: 9

FOR INTERNAL USE ONLY

DO NOT DISTRIBUTE

ALAMEDA: Second Floor





Space Use

- Classroom
- Office
- Rest Room
- Special Purpose
- Corridor
- Other
- Stairs/Elevator

School Grounds

- Campus Footprints
- Athletic Field
- Playground: Paved
- Playground: Unpaved
- Streets
- Doors

Total Number Of Rooms By Classification

Classrooms: 3	Special Purpose: 0
Office Spaces: 0	Storage: 2